Quincke, Herrlich, Brookhouse, Rochelt, Blunt, Opensovsky); in all 16 with 6 recoveries; *b*, those where the communication was present (Radex, Payne, Bacchius, Finne, Runeberg); in all 5 with 3 recoveries; and *c*, those with a doubtful diagnosis (Sedgwick, Queiss, Waugh), in all 3 with 3 deaths.

VALERIUS IDELSON.

SKIN GRAFTING ACCORDING TO THIERSCH.[1]

Reverdin's important discovery of skin grafting in 1870 soon found its application in hospital practice, but lately it has fallen into disuse on account of two faults, one an after contraction of the skin covered granulation surface, the other is a separation of the healed skin.

Thiersch states that the healing of a granulating surface depends on two factors, viz.: first in the changing of the soft succulent blood-carrying granulation papillæ into the bloodless dry cicatricial papillæ, a result which brings about a diminution of the surface and the drawing together of the neighboring parts. Second, a covering over of the contracted papillæ with epidermic cells. Both of these factors, the contraction of the wound and the growth of the pellicle take place together within certain limits, and when these limits are reached the granulating surface remains stationary.

If skin be placed on granulations which have not attained their maximum of contraction the process keeps up under the transplanted skin, and there results the drawing together of the part with all the evils of cicatricial contraction.

If, on the contrary, the skin be applied to a granulating surface which has reached its maximum of shrinking, a further contraction will not take place, but the succulent granulations remain under the healed skin, and the slightest mechanical irritation is sufficient to stir up hæmorrhages or exudations, this causing the falling off of the skin which has been placed over them.

If these theories be true then both bad results of skin grafting are

[1]By E. PLESSING, (Leipzig) *Archiv. f. Klinische Chirurgie*, bd., 37, hft. 1.

in a measure, due to the construction of the granulation tissue. Perpendicular sections show clearly two layers in granulating tissue, a lower layer, more or less dense, according to the age of the granulations and in which the capillary net work occupies a horizontal position, and from this dense layer the vascular branches run out perpendicularly, and form the upper or warty layer.

This upper layer plays the important part in the shrinking process as well as in the insecurity of the result. On account of this, Thiersch proposed to remove this upper stratum before transplanting the skin. Prof. Maas says that the important point for success is the way in which the freshening up has been done, it is not only necessary to freshen up at the edges of the ulcer, but above all, it is important to remove thoroughly the upper layer, and to expose completely the lower one with its horizontal capillaries, and between this layer and the transplanted flap a thorough adhesion will take place which can never be disturbed by cicatricial contraction.

The way in which skingrafting is carried out in the Leipsic Clinic is as follows:

Complete disinfection of the part from which the skin is to be taken, (any disinfectant may be used, but during the course of the operation a 6 per 1000 sterilised salt solution is employed) then in the granulating wounds, all the soft granulations are scraped away with a sharp spoon, the bleeding surface irrigated with the salt solution, sponged, covered with protective and compressed for 5 or 10 minutes till hæmorrhage has ceased. It is important that the right stage of granulation development should be reached before operating. The results are best when the granulations are about six weeks old, and their growth has been limited by repeated cauterisation and compression. When the wound is thoroughly prepared the skin grafting begins. The skin of arm and thigh is most often employed.

The skin free from fat, must be well stretched by the left hand, the right hand carries a razor with a long, wide and concave blade. The razor is held flat and is slowly drawn with a sawing motion through the upper layers of the skin. During this process the knife must be kept moist with the salt solution. The transferring of the grafts from

the knife to the prepared surface takes place immediately, the blade is laid on the wound and the edge of the graft is drawn over on to the wound by means of a probe, and as the blade is withdrawn it slips into place. The position of the graft may be corrected at will either with a probe or a small brush. The flap may also be shortened if necessary. The complete area is to be covered with strips of skin, and these strips should over lie the edges of the wound and come together as close as possible even overlapping each other slightly. The skin is gently pressed in place with a spatula. The dressing to be applied should protect and maintain the skin in its new position. The results are better when a moist dressing which is changed daily is used. The neighborhood of the wound is smeared with oil to prevent the dressing from sticking.

The grafts are covered with a strip of protective, soaked in salt solution, over this comes a pad of cotton, also moistened with salt water, this pad is covered by a large piece of protective, then comes another pad of dry cotton, and all is held in place by a cotton bandage, over which a dextrine bandage is applied to prevent slipping. If a dry dressing is to be employed, an iodoform one is the best. The places from which the skin has been removed are covered with iodoform dust, a dry dressing applied and left for one or two weeks.

The changes which are to be observed in the grafts within the first few days, are as follows; If they are of a pinkish color, success is pretty certain, if white, they will drop off in a few days; blood under a graft gives it a bluish color, endangers the healing process, but does not always lead to suppuration. It is possible for various forms of bacteria to find entrance into the wound and prevent healing; to do away with this danger, the dressing should be changed every day during the first week, and the surface irrigated with sterilized salt water.

If the wounded surface is not covered with grafts there appears on their free border a fibrinous exudation, and separation of the grafts begins, the healed ones detach themselves, or small epidermal blisters filled with pus appear on the healed spots and form small ulcers which gradually increase in size.

It also happens that the super-imposed skin is broken through from below by granulations, and in this manner disappears, at least, temporarily, but later when the granulations recede the epidermal islets are again seen. This the author does not believe to be due to an infectious process, but thinks it is because the grafting has been done too soon.

Syphilis may prevent the grafts from healing. The author analyzes a series of 40 cases, in which transplantation was carried out 78 times, 17 times on fresh wound surfaces, 61 times on scraped granulating surfaces. In 58 times the healing succeeded perfectly, 12 times it was incomplete, and eight times it was a total failure and the prodeeding had to be repeated.

In summing up he lays stress on the following points; Careful disinfection of the hands and instruments, newly prepared sterilized salt solution (6 per 1000), proper choosing of time of operation, thorough hæmostasis, most complete covering possible of the wound with strips, immobilisation of the part, careful bandaging, daily changes of dressing, accompanied by thorough irrigation.

The results are better on scraped granulation surfaces than on loose or connective tissue (faseia, periosteum), glandular and muscular tissue give pretty good results. Spongy-bone tissue and exposed tendons yield no permanent result. Adhesion of grafts has never been obtained on compact bone. F. C. Husson.